

## **REMARKS/ARGUMENTS**

The Office Action dated October 5, 2010, has been carefully reviewed and the following remarks are responsive thereto. As presented above, claims 1, 3, 6, 8, 12, and 16 have been amended. No new matter has been added.

Claims 1, 3-6, 8-12, 14-16, and 18-21 remain pending upon entry of the present amendment. Reconsideration and allowance are respectfully requested.

### **Claim Rejections - 35 USC§112**

The Office Action rejected claims 1, 3-6, 8-12, 14-16, and 18-21 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. As presented above, claims 1, 3, 6, 8, 12, and 16 have been amended, with the suggestions in the Office Action being taken into account. By these amendments, the applicants respectfully submit that claims 1, 3, 6, 8, 12, and 16 now particularly point out and distinctly claim the subject matter of the present invention, and thus conform to the provisions of 35 U.S.C. §112. Hence, withdrawal of the rejection of claims 1, 3, 6, 8, 12, and 16 under 35 U.S.C. §112, second paragraph is respectfully requested. Accordingly, the rejections of claims 4, 5, 9-11, 14, 15, and 18-21 as being dependent on the rejected independent claim are respectfully requested to be withdrawn.

### **Claim Rejections - 35 USC§103**

The Office Action rejected claims 1, 3, 5, 16, 18, 20, and 21 under 35 U.S.C. §103(a) as being unpatentable over Li et al. (US Publication No. 2006/0182119 A1, hereinafter referenced as “Li”) in view of Iwata et al. (US 7047316 B2, hereinafter referenced as “Iwata”). The rejection is respectfully traversed for the following reasons.

#### **As per Claim 1:**

Claim 1 of the present application recites:

A method for realizing QoS guarantee in a MPLS network, comprising:

creating an individual QoS resource list in each edge router to record a resource state corresponding to a path;

each edge router assigning resources to a user terminal which makes a request based on said QoS resource list and updating the QoS resource list; and

wherein the resource states of the paths from an edge router to all other edge routers in the same domain are recorded in said QoS resource list.

With reference to Li, it discloses a system and method for implementing resource allocation in network communication, in which a QoS edge router (QER) list is formed by edge routers along a data flow path, but only the edge router connected with the destination terminal stores the QER list (see, e.g., abstract, paragraphs [0171]-[0177] and figure 5 of Li). By comparing claim 1 with Li, it can be seen that claim 1 includes the following distinguishing technical features from Li:

“creating an individual QoS resource list in each edge router to record a resource state corresponding to a path;

each edge router assigning resources to a user terminal which makes a request based on said QoS resource list and updating the QoS resource list; and

wherein the resource states of the paths from an edge router to all other edge routers in the same domain are recorded in said QoS resource list.”

By these distinguishing technical features, claim 1 solves the technical problem of how to efficiently and effectively allocate resources for a QoS guaranteed path by creation of individual QoS resource list in each edge router.

With reference to Iwata, it discloses a link state routing communication device allowing path precalculation satisfying the required quality of a connection and reducing the call blocking probability. According to Iwata, a path satisfying a connection request can be selected from a plurality of precalculated paths which are stored for each destination in a memory; the precalculated paths reflect the latest link resource information using the feasibility check operation or precalculated path update operation; and in a border node, summarized information is calculated based on precalculated paths (see, e.g., abstract of Iwata).

Iwata fails to disclose or teach the above distinguishing technical features of claim 1 because:

1) Iwata does not disclose or teach “creating an individual QoS resource list in **each** edge router to record a resource state corresponding to a path.”

Claim 1 recites that an individual QoS resource list is created in each edge router to record a resource state corresponding to a path.

Iwata discloses a border communication device for link state routing designed to be used in a multi-level hierarchical network (see, e.g., column 15 lines 19-34 and figure 12 of Iwata). However, Iwata does not disclose or teach that such border communication device for link state routing is applied in **each** edge router in the network.

Therefore, Iwata does not disclose or teach the feature “creating an individual QoS resource list in each edge router to record a resource state corresponding to a path” in claim 1 of the present application.

2) Iwata does not disclose or teach “each edge router assigning resources to a user terminal which makes a request based on said QoS resource list and **updating the QoS resource list.**”

According to claim 1, each edge router updates its QoS resource list after assigning resources to a user terminal based on the QoS resource list. Updating a QoS resource list in claim 1 is based on the assignment of resources according to the QoS resource list.

However, Iwata recites that “*The path resource information stored in the precalculated path resource information memory 322 is updated when the link resource information stored in the link resource information memory 31 is updated. Alternatively, it is periodically updated independently of the link resource information stored in the link resource information memory 31.* The link resource information update section 21 updates the link resource information stored in the link resource information memory 31 when a change of corresponding link resource information is detected by comparing the received link resource information from the link resource information receiver 1 with the stored link resource information in the link resource information memory 31” (see, e.g., column 7 lines 1-12 of Iwata). In addition, figures 2 and 9 of Iwata show that **no** update operation is performed for the path/link resource information after resources are allocated to a user terminal. Therefore, the way of updating the path/link resource information in Iwata is completely different from that of updating the QoS resource list in claim 1.

Accordingly, Iwata does not disclose or teach the feature “each edge router assigning resources to a user terminal which makes a request based on said QoS resource list and updating the QoS resource list” in claim 1.

3) Iwata does not disclose or teach “the resource states of the paths from an edge router to **all other edge routers in the same domain** are recorded in said QoS resource list.”

Claim 1 recites that the resource states of the paths from an edge router to all other edge routers in the same domain are recorded in said QoS resource list.

However, Iwata does not disclose or teach recording the resource states of the paths from an edge router to all other edge routers in the same domain. In particular, FIG. 14G of Iwata *“represents the precalculated paths 521-524 from the border node 501 to the border node 503”* (see, e.g., column 16 lines 17-21 of Iwata), which shows that only the paths from the node 501(a) to 503(c) are recorded in the precalculated path information table 531 in Iwata, though all the border nodes 501(a), 503(c), and 505(d) in this example are coincidentally involved in these paths. Iwata does not disclose or teach any feature for recording the resource states of the paths from an edge router to all other edge routers in the same domain in a QoS resource list of the edge router.

Therefore, Iwata does not disclose or teach the feature “the resource states of the paths from an edge router to all other edge routers in the same domain are recorded in said QoS resource list” in claim 1.

For the above reasons, Iwata is at least silent on the above distinguishing technical features of claim 1 from Li.

Further, the above distinguishing technical features of claim 1 are not disclosed or taught by other documents cited in the Office Action:

Rabie et al. (US Publication No. 2003/0076829 A1, hereinafter referenced as “Rabie”) discloses a method of bandwidth management in a multiservice connection-oriented network which uses one or more overbooking factors and one or more overbooking models. The method allows an edge node which has received a connection request to accurately determine the bandwidth available on a given link in the network by ensuring that different overbooking models and different overbooking factors are normalized at the edge node (see, e.g., abstract of Rabie).

Kurose et al. (US Publication No. 2003/0084089 A1, hereinafter referenced as “Kurose”) discloses that in a data transfer apparatus, a transferring destination information reader reads information of a transferring destination terminal associated with a primary destination terminal based on a communication quality request to the primary destination terminal received from a source terminal. A resource reservation instructor gives instructions for a communication resource reservation for purposes of a communication of the quality to the transferring destination terminal. A resource reserver determines whether or not a communication resource of the transferring destination terminal has been reserved based on the instructions by the resource reservation instructor, and provides a result of the determination to the resource reservation instructor (see, e.g., abstract of Kurose).

Matsubara et al. (US Patent No. 7,215,640 B2, hereinafter referenced as “Matsubara”) discloses that for on-demand Quality of Service (QoS) transmission of packets, edge nodes update a TERMINAL-PORT TABLE as terminals log-on and then pass their node ID to each terminal that logged on. The nodes establish Quality of Service (QoS) assured pre-set paths through the WAN with conventional IP routing and accordingly update their NODE-PATH TABLE to provide links between the pre-set paths (see, e.g., abstract of Matsubara). Although several tables are involved in Matsubara, it fails to disclose any table created in each edge router for recording the resource states of the paths from the edge router to all other edge routers in the same domain.

Therefore, none of Rabie, Kurose and Matsubara discloses or teaches the above distinguishing technical features of claim 1 from Li. In addition, the distinguishing technical features of claim 1 are not common knowledge in the art.

In summary, the prior art, as a whole, does not suggest or teach the above distinguishing technical features. The applicants respectfully submit that the prior art does not provide any relative teachings for one of ordinary skill in the art to acquire the technical scheme defined in claim 1 over Li with a combination of the above distinguishing technical features and further solves the technical problem of the present invention. The applicants respectfully submit that it is **non-obvious** for one of ordinary skill in the art at the time of the invention to modify Li by the existing technology in the prior art, to solve the problem solved by the present invention. Accordingly, claim 1 conforms to the provisions of 35 U.S.C. §103.

As such, the applicants respectfully submit that claim 1 is in condition for allowance.

**As per Claims 3 and 5:**

Since independent claim 1 complies with the requirements of non-obviousness, dependent claims 3 and 5, which depend on claim 1, are also allowable.

**As per Claim 16:**

Claim 16 of the present application is an apparatus implementation of the method claimed in claim 1 and comprises all the elements of claim 1.

As stated above, claim 1 is allowable. Therefore, claim 16 is also allowable.

**As per Claims 18 and 20:**

Since independent claim 16 complies with the requirements of patentability, claims 18 and 20, which depend on claim 16, are also allowable.

**As per Claim 21:**

Claim 21 of the present application defines an MPLS network for realizing QoS guarantee, and the MPLS network comprises the edge router defined in any one of claims 16-20. So, claim 21 at least comprises all the elements of independent claim 16 and is allowable.

The Office Action rejected claims 6, 10 and 11 under 35 U.S.C. §103(a) as being unpatentable over Li in view of Rabie and Iwata. The rejection is respectfully traversed for the following reasons.

**As per Claim 6:**

Claim 6 of the present application defines a method for establishing a QoS data path in a MPLS network, comprising: a user terminal sending a QoS resource request to an ingress edge router; said edge router determining information of a path to an egress edge router of the QoS resource request; said ingress edge router determining whether the resource request is accessed or rejected based on comparing available resources of the requested resources corresponding to the path recorded in a QoS resource list with bandwidth resources requested in said resource request;

and when the resource request is determined to be accessed, updating said QoS resource list; and wherein said QoS resource list is created in each edge router, and the resource states of the paths from the edge router to all other edge routers in the same domain are recorded in said QoS resource list.

It can be seen that claim 6 comprises all the elements of claim 1.

As stated above, claim 1 complies with the requirements of patentability. For the similar reasons discussed with respect to claim 1 above, claim 6 is also allowable.

**As per claims 10 and 11:**

Since independent claim 6 complies with the requirements of patentability, dependent claims 10 and 11, which depend on claim 6, are also allowable.

The Office Action rejected claims 12, 14, and 15 under 35 U.S.C. §103(a) as being unpatentable over Kurose in view of Li and Iwata. The rejection is respectfully traversed for the following reasons.

**As per claim 12:**

Claim 12 of the present application defines a method for terminating QoS data transmission in a MPLS network, comprising: an ingress edge router receiving a resource releasing request from a user terminal; said ingress edge router releasing the resources occupied by said user terminal; and said ingress edge router modifying its QoS resource list which records a resource state corresponding to a path; and wherein said QoS resource list is created in each edge router, and the resource states of the paths from the edge router to all other edge routers in the same domain are recorded in said QoS resource list.

It can be seen that claim 12 of the present application comprises all the elements of claim 1.

As stated above, claim 1 complies with the requirements of patentability. For the similar reasons discussed with respect to claim 1 above, claim 12 is also allowable.

**As per claims 14 and 15:**

Since independent claim 12 complies with the requirements of patentability, dependent claims 14 and 15, which depend on claim 12, are also allowable.

The Office Action rejected claims 4 and 19 under 35 U.S.C. §103(a) as being unpatentable over Li in view of Iwata and Matsubara. The rejection is respectfully traversed for the following reasons.

**As per claim 4:**

Since independent claim 1 complies with the requirements of patentability, the dependent claim 4, which depends on claim 1, is allowable.

**As per claim 19:**

Since independent claim 16 complies with the requirements of patentability, the dependent claim 19, which depends on claim 16, is also allowable.

The Office Action rejected claims 8 and 9 under 35 U.S.C. §103(a) as being unpatentable over Li in view of Rabie, Iwata and Matsubara. The rejection is respectfully traversed for the following reasons.

**As per claim 8:**

Since independent claim 6 complies with the requirements of patentability, the dependent claim 8, which depends on claim 6, is also allowable.

**As per claim 9:**

Since claim 8 complies with the requirements of patentability, the dependent claim 9, which depends on claim 8, is also allowable.

**Conclusion**

In view of the above, entry of the present Amendment and allowance of the pending claims are respectfully requested. If the Office has any questions regarding this Amendment, the Office is requested to contact the undersigned.

Respectfully submitted,

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